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EP 0491252 A1 WO 96/30979 A1 DE 002515688 A1  
FR 002701345 A1 FR 002612031 A1 US 4817910 A

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(54) Abstract Title

Cable management

(57) A patch panel, Figure 4 or jumper ring panel, Figure 5, eg for telephone distribution cabinets, has cable management supports 20, 21 mounted thereon by means of mushroom heads 26 which engage channels 15, 19. One or more patch leads may be carried in each support which may be slid in position along the channel, or in another arrangement pushed in and rotated 90° to lock in place.

Fig4

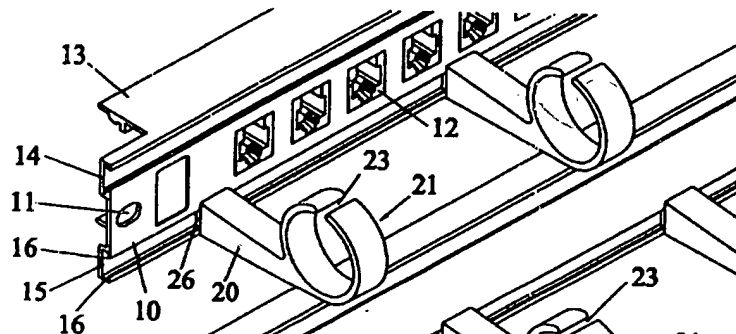
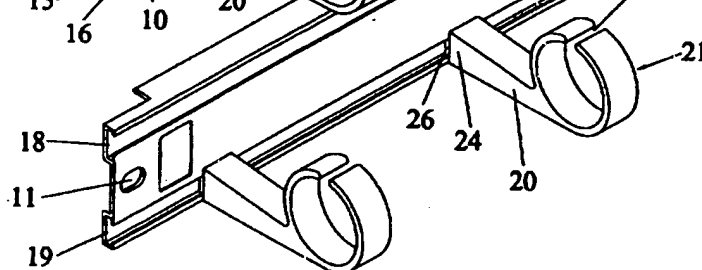
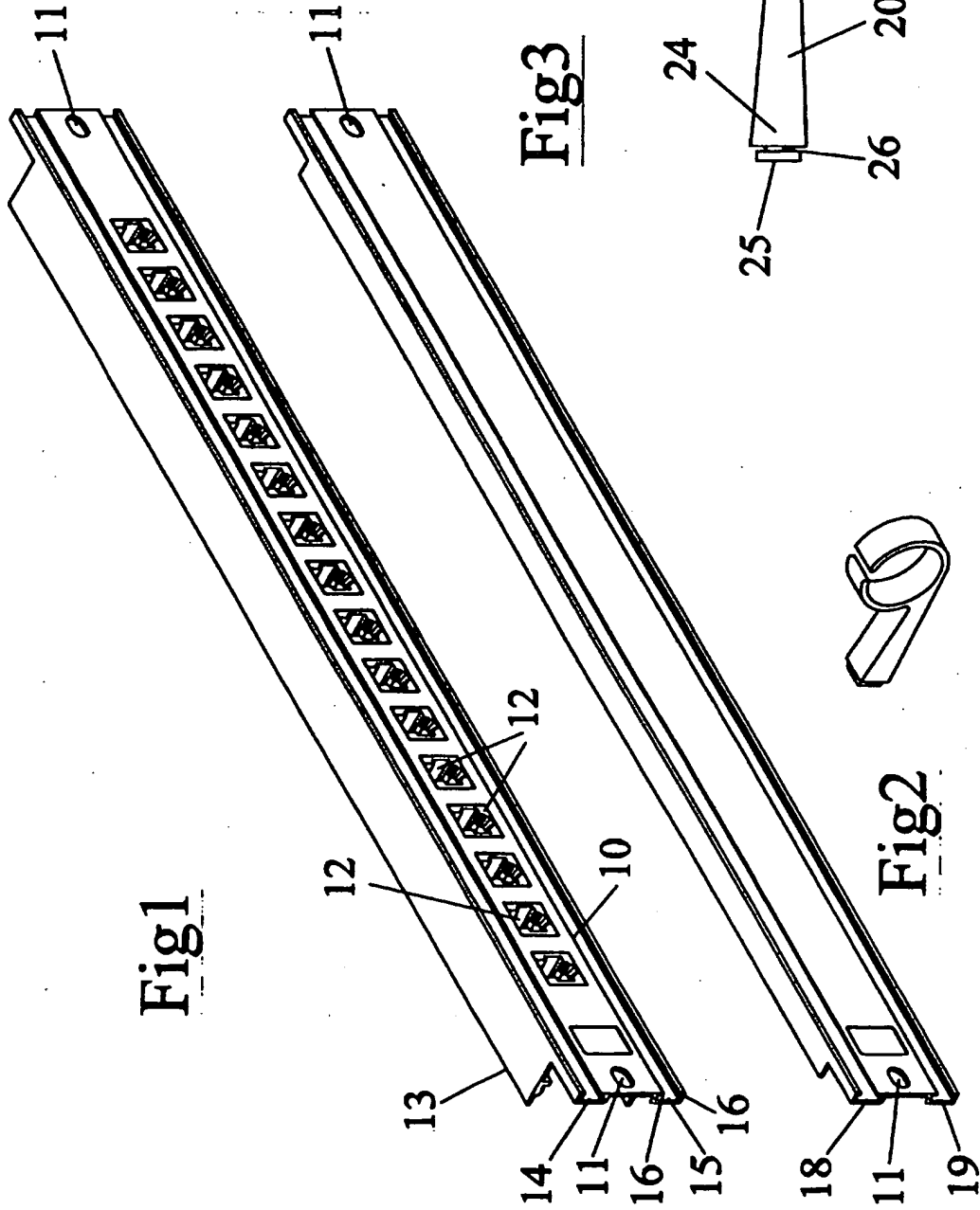
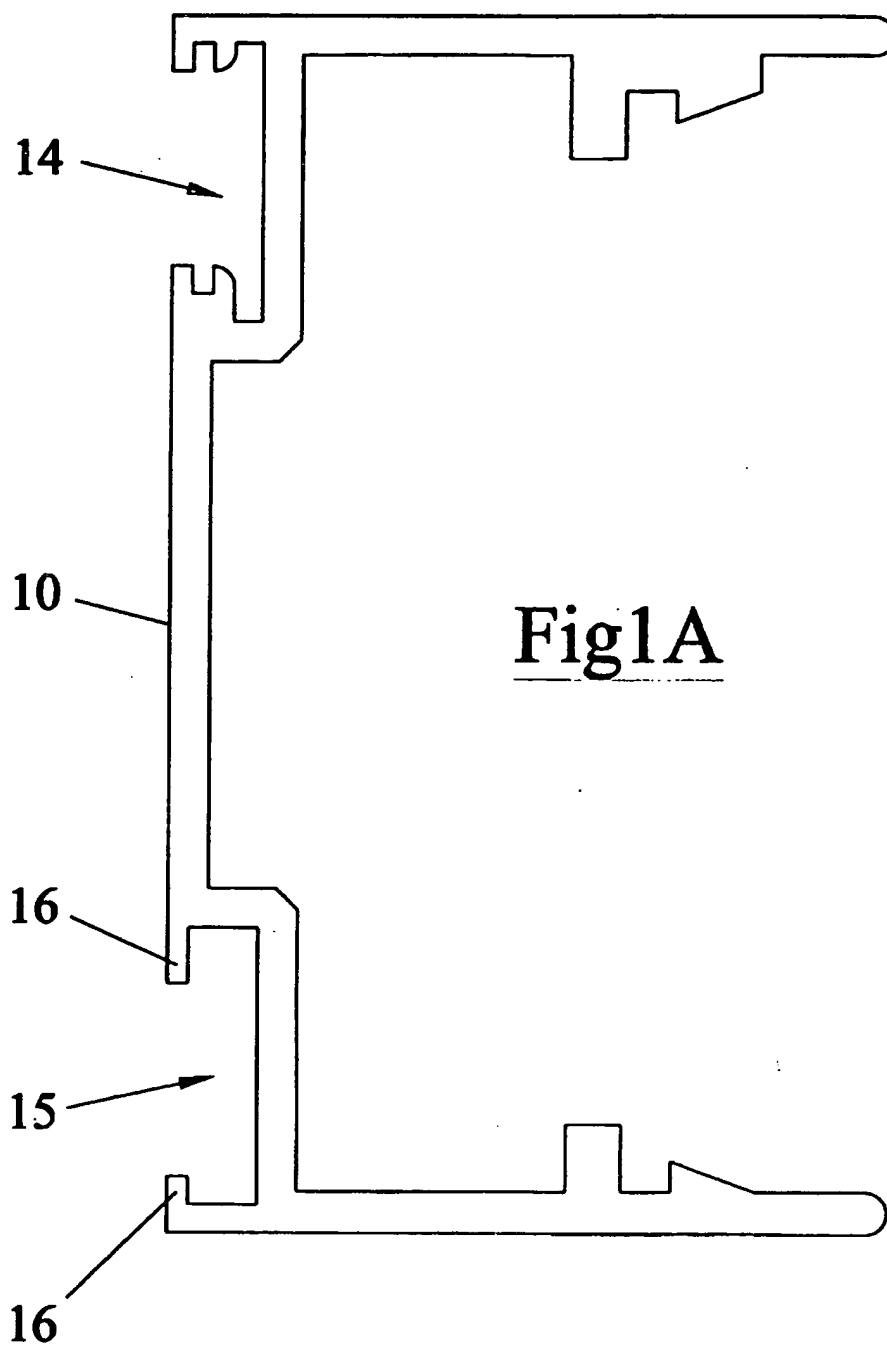


Fig5



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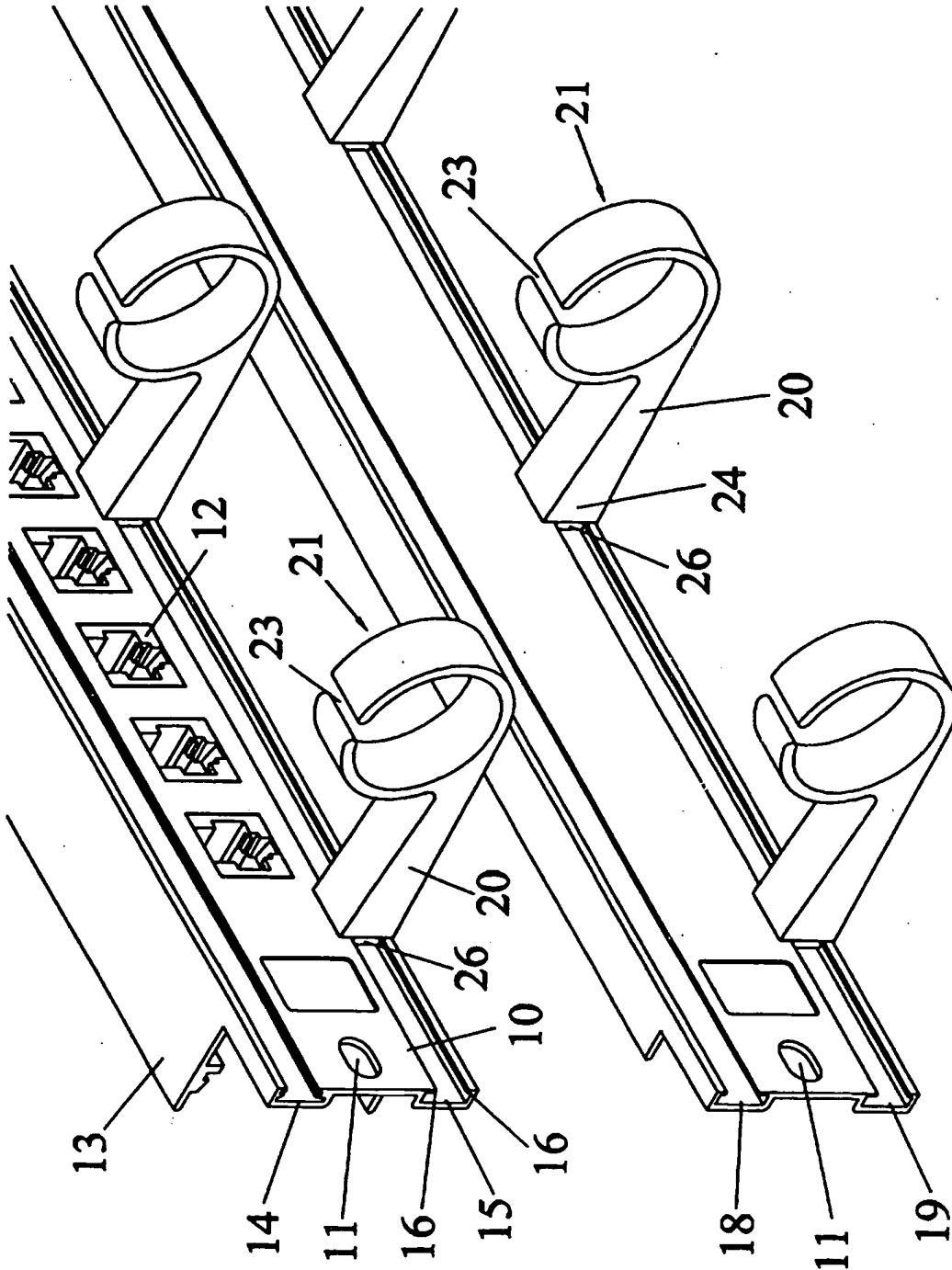


Fig4

Fig5

## CABLE MANAGEMENT

This invention relates to a patch panel, and in particular to such a panel including cable management for patch leads used with the panel. The invention further relates to a jumper ring panel for use in a patch panel frame and also  
5 including cable management for patch leads.

Patch panels are very widely used to allow the interconnection of different pieces of equipment. For example, an in-house telephone switch may have its circuits connected to a first patch panel mounted on a frame in a patch panel cabinet, a second patch panel being closely disposed to the first patch panel  
10 and having all of the wires from the different telephone outlets connected thereto. Patch leads are used to interconnect the first and second patch panels, so that any particular extension plugged into a telephone outlet may be connected to a particular circuit of the telephone switch.

The patch leads used are typically 500mm or perhaps 1m long, though  
15 the patch panels which are interconnected might have their respective sockets 100mm apart. Consequently, for each interconnection a relatively long loop of patch lead hangs down from the patch panels. When all of the sockets of the two patch panels are interconnected by patch leads, there is an unsightly mass of tangled leads hanging down from the patch panels – but more importantly, in  
20 the event that a patch lead is to be plugged into a different socket, the mass of leads can twist and lock together, so making adjustments somewhat difficult. Moreover, many patch leads employ RJ45 connectors on their ends and those connectors have a locking tab which projects away from the main body of the connector. On attempting to disentangle a patch lead from a mass of loops

hanging down from the panels, that locking tab tends to catch on to other leads and make it very difficult to remove a selected lead.

In an attempt to address the above problems, one aspect of the present invention provides a patch panel comprising a frame supporting a multiplicity of wire connectors on one side and having a plurality of sockets on a second side for the connection thereto of patch leads, and there being at least one cable-management support inter-engageable at a selected position with the second side of the frame and adapted to carry one or more patch leads.

It will be appreciated that by employing a plurality of cable-management supports each inter-engaged at respective selected positions along the length of the patch panel frame, it is possible to control the patch leads so that they do not become entangled to the same extent as usually occurs. Consequently, the reconfiguring of the connections made at a patch panel becomes much simpler, quite apart from the aesthetic improvement afforded by using this invention.

Preferably, the second side defines a track extending therealong, the or each cable management support being inter-engageable with the track at the selected position. For example, the track may comprise a re-entrant groove extending along the length of the frame, each cable management support having a head which may be engaged with that groove, so as to be held at a chosen position.

In a preferred embodiment, the groove is in the form of a channel extending along a face of the patch panel, the outer edges of the channel each being provided with a lip directed towards the other lip such that the opening to the channel is narrower than the width of the channel behind the lips. Each

cable management support may have a head behind which is a groove, the width across the groove being substantially the same as the distance between the lips, and the width of the head being substantially the same as that of the channel whereby the head may be received into the channel from one end and  
5 then slid therealong to the desired position. In an alternative arrangement, the head may be configured to permit engagement with the channel at a desired position, but with the support at 90° to its normal position; then, on turning the support through 90°, the head may securely engage behind the lips of the channel.

10 The support itself preferably has a loop portion in which may be received a number of patch leads. Though each lead could be threaded individually through the loop portion, it is preferred for there to be a gap in the material defining the loop which gap is sufficiently wide to permit a single lead to be passed therethrough and so be received within the loop. Advantageously, the  
15 loop portion is slightly resilient and the gap is slightly narrower than the width of a typical patch lead, whereby the gap must be sprung open to a small extent to permit a lead to pass therethrough and enter the loop itself. In this way, inadvertent release of a lead from the loop portion may be obviated. With the preferred form of channel, such a support may be engaged with the channel in  
20 either of two dispositions – that is, with the loop portion horizontal or vertical.

The loop portion may be provided at one end of an arm adapted to project away from the patch panel, the other end of the arm being configured for inter-engagement with the patch panel. Thus, in the preferred arrangement having a

track with which a head on the support engages, that head would be provided on said other end of the arm.

This invention extends to a jumper ring panel having a face plate adapted for securing to the frame of a patch panel cabinet, the panel having a channel  
5 extending therealong, and at least one cable management support engaged with the channel and slidable therealong to a required position. Thus, such a jumper ring panel is similar to the patch panel described above except that no RJ45 (or other) sockets are provided thereon. However, the jumper ring panel may be essentially the same as the patch panel insofar as the cable  
10 management arrangements of this invention are concerned.

By way of example only, two specific embodiments of this invention will now be described in detail, reference being made to the accompanying drawings, in which:

Figure 1 is an isometric view of a front face of an embodiment of a patch  
15 panel according to this invention;

Figure 1A is a vertical section through the front face of the panel as shown in Figure 1;

Figure 2 is an isometric view of a jumper ring panel as a second embodiment of this invention;

20 Figure 3 is an isometric view of a cable management support for use with the patch panel or jumper ring panel of Figures 1 or 2;

Figure 4 is a view on the patch panel of Figure 1, but on an enlarged scale and with two supports connected thereto; and



Figure 5 is a view on the jumper ring panel of Figure 2, but on an enlarged scale and with three supports connected thereto.

Figure 1 diagrammatically illustrates an embodiment of patch panel of this invention, which comprises a front face 10 having a pair of apertures 11 by means of which the panel may be secured to side members of a patch panel frame, as provided typically within a patch cabinet. Along the front face 10 is a plurality of RJ45 sockets 12, each of which may receive one end of a patch lead provided with an RJ45 plug on its end. The patch panel includes a flange 13 projecting rearwardly and supporting therebelow a multiplicity of IDC blocks each associated with a RJ45 socket 12, to permit the connection thereto of cabling to terminate at the panel. Thus far, the panel is entirely conventional and will not be described in further detail here.

The front face 10 includes two channels 14 and 15 extending therealong from one end to the other, with one channel above the row of sockets 12, and the other channel below that row. Channel 14 is configured to support a label strip, to carry an identifier code for each socket. Channel 15 is essentially of rectangular cross-section but includes a pair of lips 16 directed towards each other in the plane of the front face 10, whereby the entrance to the channel is narrower than the width of the channel behind the lips - see Figure 4. in particular.

Figure 2 shows a jumper ring panel which is similar to the patch panel of Figure 1, but does not include a row of RJ45 sockets. The panel has upper and lower channels 18 and 19, each of the same configuration as channel 15 of the patch panel of Figure 1.

Figure 3 illustrates a cable management support for use with the patch panel of Figure 1 or the jumper ring panel of Figure 2. The support is of moulded plastics material and has an arm 20 of tapering rectangular cross-section, which blends into a loop portion 21 at its smaller end 22. The loop portion is essentially of circular shape and has a gap 23 formed therein. At the larger end 24 of the arm 20, there is formed a head 25 joined to the arm proper by means of a relatively narrow web 26, a groove thus being formed around the web between the head 25 and end 24 of the arm.

As shown in Figures 4 and 5, the support of Figure 3 may be engaged with a channel 14 or 15 of the patch panel of Figure 1 or a channel 20 or 21 of the jumper ring panel of Figure 2. The support is engaged with the respective groove from the end of the channel, by sliding the arm at 90° to the face of the panel, along the length of the channel. In this way, the head 25 engages behind the lips 16 of the channel and prevents the arm disengaging from the channel whilst permitting the support to be positioned where required.

In use, prior to the mounting of a panel to a frame within a cabinet, the required number of supports (Figure 3) are engaged with a channel in the panel from the end thereof and following the bolting of the panel to the frame, the supports may be positioned as required. Then, on connecting a patch lead to a patch panel, the lead may be pressed through the gaps 23 of the appropriate supports so as to be carried thereby and to maintain the bundle of patch leads in a neat and orderly manner. To assist with this, each support may be positioned with its loop disposed horizontally or vertically, as required.

**CLAIMS**

1. A patch panel comprising a frame supporting a multiplicity of wire connectors on one side and having a plurality of sockets on a second side for the connection thereto of patch leads, and there being at least one cable-  
5 management support inter-engageable at a selected position with a side of the frame and adapted to carry one or more patch leads.
2. A patch panel as claimed in claim 1, wherein said at least one cable management support is engageable with the second side of the patch panel.
3. A patch panel as claimed in claim 2, wherein the second side defines a  
10 track extending therealong, the cable-management support being inter-engageable with the track at a selected position.
4. A patch panel as claimed in claim 2 or claim 3, wherein the track is in the form of a re-entrant channel extending along the length of the panel.
5. A patch panel as claimed in claim 4, wherein the re-entrant channel is of  
15 a rectangular cross-section and has a pair of lips provided at the mouth of the channel and directed towards each other whereby the width of the channel at its mouth is narrower than the width of the channel behind the lips.
6. A patch panel as claimed in claim 4 or claim 5, wherein the cable management support has a head joined to the main part of the support by a web,  
20 the head being receivable in the channel with the web disposed at the mouth of the channel.
7. A patch panel as claimed in any of claims 4 to 6, wherein the support is engageable with the channel only from an end of the channel and may be slid along the length of the channel to the desired position.

8. A patch panel as claimed in any of the preceding claims, wherein the cable management support has an arm one end of which is adapted for inter-engagement with the panel and the other end of which is provided with a cable supporting loop portion.
- 5 9. A patch panel as claimed in claim 8, wherein a gap is provided in the loop portion and the loop portion is resiliently deformable whereby a cable may be sprung through the gap to be received in the loop portion.
10. A patch panel as claimed in claim 8 or claim 9, wherein the cable management support is moulded from a plastics material.
- 10 11. A jumper ring panel having a face plate adapted for securing to the frame of a patch panel cabinet, the panel having a channel extending therealong, and at least one cable management support engaged with the channel and slidable therealong to a required position.
12. A jumper ring panel as claimed in claim 11, wherein the channel is of  
15 rectangular cross-section and has a pair of lips provided at the mouth thereof which lips are directed towards each other whereby the width of the channel at its mouth is narrower than the width of the channel behind the lips.
13. A jumper ring panel as claimed in claim 12, wherein the cable management support has a head joined to the main part of the support by a web,  
20 the head being receivable in the channel with the web disposed at the mouth of the channel.
14. A jumper ring panel as claimed in any of claims 11 to 13, wherein two similar parallel channels are provided along the length thereof, each for receiving cable management supports.

15. A patch panel or jumper ring panel substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.



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INVESTOR IN PEOPLE

Application No: GB 9905242.5  
Claims searched: 1-15

Examiner: Michael Prescott  
Date of search: 29 June 2000

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.R): H2C (CCA, CCH, CEA, CEB, CEX)

Int CI (Ed.7): H02G 3/32; H04Q 1/06, 1/16

Other: Online databases: EPODOC, JAPIO, WPI

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0491252 A1 (Siemens AG) see cable clips 10 snap-fitted into profiled side of channel 1	1-5, 8-12, 14
X	WO 96/30979 A1 (Rittalwerk Rudolph Loh GmbH & Co. KG) see abstract	1-3, 8-10
X	DE 2515688 A1 (Siemens AG) see page 11, last paragraph et seq	1-14
X	FR 2701345 A1 (Constant, M) see Figures 7, 10 - cable guide 500 - and page 12	1, 2, 8-10
X	FR 2612031 A1 (Police, P) note stop 13, which engages in a channel in profile 30, Figure 5	1-3, 8-11, 14
X	US 4817910 (Molnar, G et al) see column 2, lines 20-44	1-8, 11-14

X Document indicating lack of novelty or inventive step  
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